

Things to Know, Understand and Do For Chapter 13: Chemical Equilibria

By the end of Chapter 13, you should

Know the law of mass action.
Understand the nature and characteristics of chemical equilibrium: <ul style="list-style-type: none"> Reactions are reversible Reactions are ongoing, even when equilibrium is established
Write the reaction quotient, Q , for a chemical reaction.
Recognize that the concentrations of solids, pure liquids and solvents are NOT included in the equilibrium constant expression.
Recognize that a large value of K , i.e. $K \gg \gg 1$, means that the reaction is product favored and the product concentrations are much greater than the reaction concentrations at equilibrium. A small value of K , i.e. $K \ll \ll 1$, indicates a reactant favored reaction in which the product concentrations are smaller than the reactant concentrations at equilibrium.
Appreciate the fact that the equilibrium concentrations may be expressed in terms of reactant and product concentrations, $[M]$, and K for this case is K_c . Alternatively, concentrations of gases can be expressed as partial pressures, P_{gas} , and K for this case is designated as K_p .
Convert between K_c and K_p using $K_p = K_c(RT)^{\Delta n}$
Use Q to decide whether a reaction is at equilibrium ($Q = K$), or if there will be a net conversion of reactants to products ($Q < K$) or products to reactants ($Q > K$).
Calculate an equilibrium constant given the reactant and product concentrations at equilibrium.
Use equilibrium constants to calculate the concentration (or pressure) of a reactant or product at equilibrium. (Using ICE box calculations)
Know how the value of K changes as different stoichiometric coefficients are used in a balanced equation, if the equation is reversed, or if several equations are added to give a new net equation.
Know how to predict, using Le Chatelier's Principle, the effect of a disturbance on a chemical equilibrium: <ul style="list-style-type: none"> a change in temperature (also predict how K will change) a change in concentration a change in volume or a change in pressure (<i>including addition of an inert gas</i>) for a reaction involving gases
Understand...
Understand the nature and characteristics of chemical equilibrium:
Understand the nature and characteristics of the equilibrium constant, K , and reaction quotient, Q .
Understand how to use K in quantitative studies of chemical equilibria

Ch 13 Homework

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Student Presentations

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